



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/716,695

11/18/2003

Highland Mary Mountain

110466-153433

6615

31817 7590 11/12/2008
SCHWABE, WILLIAMSON & WYATT, P.C.
PACWEST CENTER, SUITE 1900
1211 S.W. FIFTH AVE.
PORTLAND, OR 97204

EXAMINER

ZHE, MENG YAO

ART UNIT

PAPER NUMBER

2195

MAIL DATE

DELIVERY MODE

11/12/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/716,695	Applicant(s) MOUNTAIN ET AL.	
	Examiner MENG YAO ZHE	Art Unit 2195	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-67 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-67 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11/18/2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-67 are presented for examination.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 14-40 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

4. Claims 14-21, 30-40 and claims 22-29 are rejected under 35 U.S.C. 101 because they recite a “system” and “apparatus” respectively; however, it appears that the system and the apparatus would reasonably be interpreted by one of ordinary skill in the art as software, per se, failing to be tangibly embodied or include any recited hardware as part of the system.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 2195

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-6, 9, 14-17, 22-25, 30-34, 41-46, 49 are rejected under 35

U.S.C. 102(e) as being anticipated by Lektion et al., Pub No. 2005/009165 (hereafter Lektion).

7. As per claims 1, 17, 31, 41, Lektion teaches a method comprising:

determining the configuration of a system of resources (Para 10);

determining the processing requirements of an application running on the system of resources (Para 31, 32);

analyzing the determined configuration and requirements in order to attempt to optimize the performance of the application (Para 36);

generating optimization suggestions from the analysis (Para 41);

dynamically applying the optimization suggestions (Para 41).

8. As per claims 2, 42, Lektion teaches wherein dynamically applying the optimization suggestions includes: dynamically allocating resources to the execution of and interaction with the application; dynamically utilizing acceleration tools (Para 41).

9. As per claims 3, 24, 33, 43, Lektion teaches wherein dynamically utilizing acceleration tools includes utilizing tools selected from a group including:
primitive performance libraries (Para 35);
managed runtime optimization settings (Para 38);
reordering portions of application execution (Para 31).

10. As per claims 4, 44, Lektion teaches wherein determining the configuration of a system of resources includes utilizing a device and environment characterization database (Para 36).

11. As per claims 5, 45, Lektion teaches wherein the device database includes information regarding the types of resources in the system of resources and information regarding the physical capabilities of these resources (Fig 3, units 45, 47; Para 29).

12. As per claims 6, 25, 34, 46, Lektion teaches wherein the environment database includes information regarding the configuration, substantially current status, and substantially current capacity of the resources within the system of resources (Para 32).

13. As per claims 9, 49, Lektion teaches wherein determining the processing requirements of an application includes utilizing an application characterization database (Para 36).

14. As per claims 23, 32, Lektion teaches predicting application performance after applying the suggested optimizations (Para 41);
monitoring the actual application performance to generate empirical data (Para 39);
comparing the actual application performance to the predicted performance (Para 39);

Art Unit: 2195

performing the method of claim 1, and utilizing the empirical data when analyzing the determined configuration and requirements in order to attempt to optimize the performance of the application (Para 36).

15. As per claims 14, 22, 30, Lektion teaches a system comprising:

a distributed application (Para 31);

a system of resources capable of executing the distributed application (Fig 3; Para 31);

a Content & Context Sensitive Accelerator capable of attempting to optimize the performance of the distributed application (Para 34);

a Device & Environment Database capable of providing information to the Content & Context Sensitive Accelerator about the system of resources (Fig 2, unit 16);

an Application Characterization Database capable of providing information to the Content & Context Sensitive Accelerator about the distributed application (Para 36);

unmanaged system software capable of utilizing and the system of resources (Para 31).

16. As per claim 15, Lektion teaches a framework library capable of providing a common set of code modules to both the distributed application and the unmanaged system software, and a runtime manager capable of managing the interaction between the system of resources and any application executing on the system of resources; and wherein the Content & Context Sensitive Accelerator is capable of attempting to optimize by providing a set of instructions to the runtime manager based, at least in part, upon the information provided by the Device & Environment Database and the

Art Unit: 2195

Application Characterization Database; and selecting which portions of the framework library will be utilized by the distributed application (Para 36).

17. As per claim 16, Lektion teaches a primitive performance library capable of providing a set of code modules that are specifically optimized for a particular resource architecture; and wherein the Content & Context Sensitive Accelerator is further capable of attempting to optimize by determining that the a first portion of the distributed application is to execute utilizing the framework library and a second portion is to execute utilizing the primitive performance library (Fig 4; Para 38).

18. Claims 54, 61 are rejected under 35 U.S.C. 102(e) as being anticipated by Gary et al., Pub. No. 2004/0025067 (hereafter Gary).

19. As per claims 54, 61 Gary teaches a method of reducing energy consumption comprising: determining the characteristics of a system of resources that an application will execute on (Para 31, 33);

determining the processing requirements of the application (Para 119);

dynamically applying a set of optimizations designed to reduce energy consumption of the application (Abstract; Para 14, 29, 36).

Claim Rejections - 35 USC § 103

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

21. Claims 7-8, 18, 26, 35, 39-40, 47-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lektion et al., Pub No. 2005/009165 (hereafter Lektion).

22. As per claims 7, 47, Lektion does not specifically teach wherein device and environment characterization database is incrementally generated as each of the resources of the system of resources is powered-on.

However, it would have been obvious to one having ordinary skill in the art of resource tracking to update the database tracking resource records only when the resource is powered on, since otherwise, the powered off resource will have no way of contacting the system and therefore the system can not know the existence of these powered off resources.

As per claims 8, 18, 26, 35, 39, 40, 48, Lektion teaches wherein the device and environment characterization database is dynamically generated utilizing a service including determining availability of resources (Para 32).

Lecture does not specifically teach collecting data from sensors coupled with the resources; analyzing the data collected; inferring an execution context characterization; estimating the capacity of each resource; and updating the device and environment characterization database.

However, in order to determine the availability of resources, it would have been obvious to one having ordinary skill in the art of resource detection to follow the steps of collecting data from sensors coupled with the resources; analyzing the data collected; inferring an execution context characterization; estimating the capacity of each resource; and updating the device and environment characterization database, since these steps are essential to any methods involving resource calculations.

23. Claims 10-13, 19-21, 27-29, 36-38, 50-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lecture et al., Pub No. 2005/009165 (hereafter Lecture) in view of Sankaranarayan and Forrest et al., Patent No. 6,799,208 (hereafter Forrest).

24. As per claims 10, 19, 27, 36, 50, Lecture does not specifically teach wherein the application characterization database includes: a static application characterization database that is capable of storing information regarding fixed characteristics of the application; and a dynamic application characterization database that is capable of storing information regarding mutable characteristics of the application.

However, Forrest teaches wherein the application characterization database includes: a static application characterization database that is capable of storing

Art Unit: 2195

information regarding fixed characteristics of the application (Column 17, lines 55-63); and a dynamic application characterization database that is capable of storing information regarding mutable characteristics of the application for the purpose of dynamically varying application resources according to needs (Abstract; Column 18, lines 20-31).

25. As per claims 11, 20, 28, 37, 51, Lektion in view of Forrest does not specifically teach wherein the static application characterization database is generated utilizing:

determining, by the application's compile time, the data types utilized by the application; determining, by the application's compile time, the frequency of the usage of the data types; determining, by the application's compile time, the resource required by the application; updating the static application characterization database with the determined information.

However, since program analysis and optimization including steps mentioned above are commonly performed at the time of the program's compilation, it would have been obvious to one having ordinary skill in the art to have the steps above be done at compile time for the purpose of making sure that the application will have all its needs met before it is sent out to be executed.

26. As per claims 12, 21, 29, 38, 52, Lektion teaches wherein the dynamic application characterization database is generated utilizing:

reading the static application characterization database (Para 36);

collecting runtime application data usage (Para 39)

Art Unit: 2195

analyzing application usage and identifying resource usage bottlenecks (Para 43);
updating the dynamic application characterization database (Para 39).

27. As per claims 13, 53, Lektion teaches predicting application performance after applying the suggested optimizations (Para 41);
monitoring the actual application performance to generate empirical data (Para 39);
comparing the actual application performance to the predicted performance (Para 39);
performing the method of claim 1, and utilizing the empirical data when
analyzing the determined configuration and requirements in order to attempt to optimize the performance of the application (Para 36).

28. Claims 55-57 and 62-64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gary et al., Pub. No. 2004/0025067 (hereafter Gary).

29. As per claims 55, 62, Gary does not specifically teach wherein determining the characteristics of a system of resources includes: determining whether the system of resources is powered either by a limited or a substantially unlimited power supply.

However, since all power supply falls either in the category of limited or unlimited supply and Gary teaches reducing power consumption in general, it would have been obvious to one having ordinary skill in the art at the time of the applicant's invention to modify the teachings of Gary with the specifics of determining whether the system of resources is powered either by a limited or a substantially unlimited power supply.

Art Unit: 2195

30. As per claims 56 and 63, Gary teaches wherein a limited power supply includes a battery (Para 120).

31. As per claims 57 and 64, Gary teaches if at least a portion of the system of resources is powered by a limited power supply, estimating how much power remains in the limited power supply (Para 120).

32. Claims 58-60 and 65-67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gary et al., Pub. No. 2004/0025067 (hereafter Gary) in view of Lection et al., Pub No. 2005/0091654 (hereafter Lection).

33. As per claims 58 and 65, Gary does not specifically teach wherein determining the characteristics of a system of resources includes utilizing a device and environment characterization database; and wherein determining the processing requirements of the application includes utilizing an application characterization database.

However, Lection teaches wherein determining the characteristics of a system of resources includes utilizing a device and environment characterization database; and wherein determining the processing requirements of the application includes utilizing an application characterization database for the purpose of tracking system and application behavior (Para 36).

It would have been obvious to one having ordinary skill in the art at the time of the applicant's invention to modify the teachings of Gary with wherein determining the

characteristics of a system of resources includes utilizing a device and environment characterization database; and wherein determining the processing requirements of the application includes utilizing an application characterization database for the purpose of tracking system and application behavior, as taught by Lektion, for the purpose of tracking system and application behavior.

34. As per claims 59 and 66, Gary teaches wherein dynamically applying a set of optimizations includes utilizing tools selected from a group including: primitive performance libraries (Para 67); managed runtime optimization settings (Para 26, 27); altering which of the resources of the system of resources executes portions of the application (Para 14); altering which of the resources of the system of resources interacts with portions of the application (Para 29); altering the capabilities of the application (Para 14, 112);

Lektion teaches altering the data provided by the application and reordering portions of application execution (Para 31).

35. As per claims 60 and 67, Gary teaches monitoring the actual application power usage (Para 60);
monitoring the amount of available power available to the application (Para 112, 120);
predicting application power usage after applying the set of optimizations;

Gary does not specifically teach dynamically applying a new set of optimizations if either the available power changes or the actual application power usage is not within a predefined range compared to the predicted application power usage.

However, it would have been obvious to one having ordinary skill in the art at the time of the applicant's invention to modify the teachings of Gary with dynamically applying a new set of optimizations if either the available power changes or the actual application power usage is not within a predefined range compared to the predicted application power usage since prediction of resource usage, which includes power usage, is commonly practiced in the field of resource management at the time of the applicant's invention.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MENG YAO ZHE whose telephone number is (571)272-6946. The examiner can normally be reached on Monday Through Friday, 7:30 - 5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2195

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/VAN H NGUYEN/
Primary Examiner, Art Unit 2194